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ABSTRACT

School identified learning disabled (LD) fourth graders (N=50) were compared with 49 fourth graders who were underachieving in school (non-LD) but were not identified as LD. Both groups were administered a battery of psychoeducational tests and their performances were compared on all measures. Results indicated considerable similarities between groups. An average of 96% of the scores were within a common range, and the performance of LD and underachieving Ss on many subtests was identical. Findings could be interpreted to support either of two conflicting viewpoints: that schools are failing to identify many LD students, or that too many non-LD students are labeled LD. (Author/CL)

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University of Minnesota

Research Report No. 13

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James E. Ysseldyke, Bob Algozzine, Mark Shinn, and Matthew McGue

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Institute for Research on Learning Disabilities

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I. Adequacy of Norm-Referenced Data for Prediction of Success

II. Computer Simulation Research on the Assessment/Decision-making/Intervention Process

III. Comparative Research on Children Labeled LD and Children Failing Academically but not Labeled LD

IV. Surveys on In-the-Field Assessment, Decision Making, and Intervention

V. Ethological Research on Placement Team Decision Making

VI. Bias Following Assessment

VII. Reliability and Validity of Formative Evaluation Procedures

VIII. Data-Utilization Systems in Instructional Programming

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Research Report No. 13

SIMILARITIES AND DIFFERENCES BETWEEN UNDERACHIEVERS AND STUDENTS LABELED LEARNING DISABLED: IDENTICAL TWINS WITH DIFFERENT MOTHERS

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Abstract

Considerable evidence exists to suggest that the learning disabilities (LD) category is primarily one of underachievement. The research reported here compared school-identified LD children with a group of children who were underachieving in school (Non-LD) but were not identified as LD. Both groups of children were administered a battery of psychoeducational tests and their performances were compared on all measures. An analysis of the results indicated considerable similarities between the groups; in fact, an average of 96% of the scores were within a common range, and the performance of LD and underachieving children on many subtests was identical. The findings could be interpreted to support either of two major conflicting viewpoints: (1) that schools are failing to identify many students who are in fact LD, or (2) that too many non-LD students are labeled as LD. This investigation demonstrates simply that as many as 40% of students may be misclassified. The implications of these results with regard to identification and placement practices are discussed.

Similarities and Differences Between Underachievers and Students Labeled Learning Disabled: Identical Twins with Different Mothers

In spite of attempts to create a more sophisticated disability, the area of learning disabilities (LD) remains largely a category of underachievement (Algozzine & Sutherland, 1977; Wepman, Cruickshank, Deutsch, Morency, & Strothers, 1975). While Federal guidelines and common definitions indicate that disorders in psychological processes are a part of LD, criteria for identification of learning disabled youngsters largely omit them and concentrate on discrepant achievement as the major identification variable (Algozzine, Forgnone, Mercer, & Trifiletti, 1979; Mercer, 1979).

Algozzine and Sutherland (1977) were critical of the then current definitions of LD (which were quite similar to those currently in vogue). Specifically, they pointed out that psychological disorders suggested in definitions of learning disabilities were relatively obscure, that ability-achievement discrepancies were unreliable based on most currently used assessment devices, and that little real evidence existed to support LD as a separate diagnostic category.

Ysseldyke and Algozzine (in press) have suggested that contemporary practices in the area of identification and classification of children with learning disabilities are founded on logically fallacious grounds; they indicated this error results in a tremendous lack of clarity relative to the nature of the LD child and that "false positive" identifications are quite prevalent. The effects of being inappropriately labeled as learning disabled are equivocal; the advantages are clearly that being

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labeled is the basis through which one receives special services for academic achievement.

Hallahan and Kauffman (1978) have suggested that a tremendous amount of overlap exists among the special education categories of emotional disturbance (ED), learning disabilities (LD), and mental retardation (MR): a similar position has been discussed by Neisworth and Greer (1975). The implication of that position is that differential treatment may be unnecessary; Hallahan and Kauffman (1978) suggested that categorically differentiated instruction was largely non-existent. It seems, then, that the diagnosis of LD may not mean that a youngster requires or will receive different treatment than the child diagnosed as ED or MR in some areas. What it does mean is that he/she will receive different instruction than the regular class peer not identified as LD.

While some evidence exists to suggest that LD is a negative stereotype (Bryan & Wheeler, 1972), for the most part, a diagnosis of LD is not believed to be as harmful as other special lables. Ysseldyke and Algozzine (in press) reviewed studies in which the effects of the LD label were investigated and concluded that "LD seems to represent a more acceptable 'handicap' than some, but it may be thought of as a less preferred label than normal" (p. 11). The advantage of special education treatment for underachievement seems to outweigh the negative effects of being labeled, at least for the LD youngster; in fact, Abroms and Kodera (1979) found it was the most preferred of the major special education categories.

Ysseldyke and Algozzine (in press) have indicated that bias exists in the assessment of LD children; they suggested that bias occurs before,

during, and after assessment. This implies that some children are identified or labeled without appropriate evidence for a disability or handicap, but perhaps more importantly, it suggests that some children are not identified when they do have a handicap. In light of the advantages of LD identification (that special education for underachievement is made available), the "false negative" child is deprived of service and/or discriminated against due to not being identified.

The extent to which LD children differ from non-learning disabled (i.e., normal) children has been investigated (Forness & Esveldt, 1975; Rickey & McKinney, 1978); the similarities and differences between LD children and children not achieving in school and not labeled as LD seems a more important comparison. The purpose of this study was to compare the test performances of a group of LD children and a group of underachieving children who were not identified as LD. It was anticipated that differences between the groups would be apparent and that those differences would have clinical, diagnostic utility.

Method

Subjects

The LD sample consisted of 50 fourth grade children who had been identified as "learning disabled" by their school districts. The average achievement level for this group of subjects was obtained for the Peabody Individual Achievement Test (PIAT) total score; it was 91.9 (S = 8.78) and indicated underachievement. Forty-nine fourth grade children who had not been identified as LD but who had scored at or below the 25th percentile on the Iowa Tests of Basic Skills administered during the fall of the current school year were included as the Non-LD sample.

The LD group had been identified within six months of the time at which they were selected to participate in this study. (This restriction was used in subject selection to reduce the effect of intervention.) Similarly, the Non-LD group had been group tested within six months of their participation. Selected demographic information is presented in Table 1; no statistical differences were indicated between the groups on any of these variables (i.e., Chi square and *t* tests were not significant, $p > .05$).

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Insert Table 1 about here

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Procedure

Each subject was administered a battery of tests as a result of participation in this study. All testing was completed by qualified psychometricians and occurred during approximately the same period of time (i.e., January to May). Demographic information was collected from the parent(s) of the children and a behavior rating scale was completed by their current teacher.

The test battery included the Wechsler Intelligence Scale for Children-Revised (WISC-R), the Peabody Individual Achievement Test (PIAT), selected subtests of the Stanford Achievement Test, the Bender Visual-Motor Gestalt Test (BVMGT), the Developmental Test of Visual-Motor Integration (DTVMI), the Piers-Harris Self-Concept Scale, and the Peterson-Quay Behavior Problem Checklist. Descriptions of each of these devices, including information on their technical adequacy, are included in Salvia and Ysseldyke (1978). The battery was selected as one including those devices commonly used with LD youngsters.

Additionally, selected subtests of the Woodcock-Johnson Psycho-educational Battery (W-J) (Woodcock & Johnson, 1977) were administered to each child. The W-J is an individually administered wide-range comprehensive set of measures of cognitive ability, academic achievement, and interest. All 12 of the W-J Cognitive Ability subtests were administered (Picture Vocabulary, Spatial Relations, Memory for Sentences, Visual-Auditory Learning, Blending, Quantitative Concepts, Visual Matching, Antonyms-Synonyms, Analysis-Synthesis, Numbers Reversed, Concept Formation, and Analogies), as well as seven of the 10 W-J Achievement subtests (Letter-Word Identification, Word Attack, Passage Comprehension, Calculation, Applied Problems, Dictation, and Proofing). The W-J Interest Battery was not administered.

Although the authors of the W-J recommend that the primary unit of interpretation of scores on the W-J should be the cluster scores, scores on individual subtests were used in comparing the performance of the LD and underachieving groups. Cluster scores are weighted or unweighted composites of two or more subtest scores. McGue, Shinn, and Ysseldyke (1979) concluded that raw scores are the more appropriate unit of analysis due to the substantial overlap of specific subtests in composition of the clusters.

Administration of the total of 49 subtests or tests to the 99 students enabled us to contrast their performance in five domains: cognitive (WISC-R, W-J Cognitive Ability Battery), academic achievement (PIAT, W-J Achievement Battery), perceptual-motor (BVMGT, DTVMI), self-concept (Piers-Harris), and behavior problems (Peterson-Quay).

Raw scores were converted to standard scores when possible:

otherwise, all analyses were completed using the number of items correct as the unit of analysis. Frequency distributions were obtained for the LD and Non-LD groups separately and independent group *t* tests were computed for subjects' scores on all tests and subtests.

To determine the extent of overlap between the groups, two methods were used based upon the distributions of scores. The first was to count the number of exact pairs of scores; that is, if a score was obtained by an LD child and a Non-LD child, it was counted as a pair. This measure was indicative of the number of times two different types of children received exactly the same score on a test or subtest. The second method was to compute the percentage of scores which were within a common range for both distributions. For example, if the 49 scores for the Non-LD group ranged from 8 to 17 and 45 of 50 of the scores for the LD group were also within that range, the "percentage of overlap" was calculated as 94/99 x 100 = 95% overlap. The range of possible pairs was 0-49, and the range of percentage of overlap was 0-100.

Following analysis of overlap, the number of "correct classifications" resulting from application of the December 1977 Federal Register definition of learning disabilities was investigated. That definition listed criteria for use by a decision-making team in determining the existence of a specific learning disability, specifying that determination should be based on "(1) whether a child does not achieve commensurate with his or her age and ability when provided with appropriate educational experiences, and (2) whether the child has a severe discrepancy between achievement and intellectual ability in one or more of seven areas

relating to communication skills and mathematical abilities" (p. 65082). Areas specified were oral expression, basic reading skill, reading comprehension, mathematics calculation, mathematics reasoning, listening comprehension, and written expression.

The definition was operationalized by using the following measures to ascertain discrepancy in five of the seven areas: written expression (W-J Written Language), basic reading skill (W-J Reading Achievement Cluster), reading comprehension (PIAT Reading Comprehension), mathematics calculation (Stanford Mathematics Calculation), mathematics reasoning (Stanford Mathematics Concepts). We identified each of the 99 students as either "LD" or "Non-LD" according to the Federal definition. Because the term "severe" is not defined in the Federal definition, we defined it three ways. Under condition A a child was said to be LD by definition if the score earned on the criterion measure was one standard deviation below average; under condition B the student was said to be LD if a one and one-half standard deviation deficit was exhibited, and under condition C the student was said to be LD if a two standard deviation deficit was evidenced. Tables were developed listing the number of students the school identified as LD and Non-LD who met the criteria of LD and Non-LD according to the Federal definition. We then used *t* tests to contrast those students who were misclassified in an effort to identify variables that differentiated the groups.

Results

Multiple methods of data analysis were used to contrast the performance of the two groups on psychometric measures. A multiple discriminant function analysis was run, using each of the test scores as an independent variable, and classification as a dependent variable. While application

of this statistical technique did reveal "discriminators," the large number of independent variables resulted in essentially chance findings. Subsequent analyses revealed so much overlap between groups that the findings of the discriminant function analysis were disregarded.

Statistics for analysis of raw score subtest differences obtained on the Woodcock-Johnson Psycho-Educational Battery appear in Table 2. An analysis of the *t* tests indicated that on the average the LD group performed significantly poorer on ten of the subtests: Memory for Sentences, Antonyms-Synonyms, Letter-Word Identification, Word Attack, Passage Comprehension, Dictation, Proofing, Picture Vocabulary, Quantitative Concepts, and Applied Problems. However, while statistical significance was observed, the absolute magnitude of the mean subtest differences for statistically significant findings (ranging from 1.06 to 3.96 raw score points) was, in our opinion, of little practical significance. Similar statistics for analyses of raw score differences between the groups on the remaining tests and subtests administered are listed in Table 3. Examination of the results indicated that the LD group performed statistically significantly poorer than Non-LD children on the PIAT subtests and that the LD children were rated by their teachers as having a significantly greater incidence of behavior problems as evidenced by the mean differences on the Peterson-Quay Behavior Problem Checklist. Once again, while statistically significant differences were observed, practical educational significance is absent. Although we found that the mean level performance of the LD children was lower on many of the measures, particularly the PIAT, and at times was significantly less than the mean level of their Non-LD peers, the magnitude of these mean differences is at best moderate, and in terms of analyses of individual cases for determination of eligibility for LD services is of

questionable utility. Our position that differences of this magnitude have little practical significance was supported by subsequent analyses.

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Insert Tables 2 and 3 about here

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In order to use these data, one must disregard group means and look at the performance of the individual and its relationship to that of other individuals. For this reason, the performance of the individuals in the two groups was examined by 1) developing individual score histograms of the distributions of the two groups on each measure, and 2) computing the percentage of overlapping cases, that is, scores in the two groups that were in a common range. Through the use of histograms, an individual's score may be placed on a continuum of earned scores and its relationships (extremeness, similarity to others in same group, similarity to others in a different group) can be examined. For example, in Figure 1, histograms of PIAT math performance show that the distribution of individual LD children's scores is similar to that of Non-LD children.

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Insert Figure 1 about here

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Percentage of overlap between the two groups ranged from 82 to 100 percent, with a median overlap of approximately 96 percent. In half of the comparisons, 96 percent or more of the scores were within a common range. Percentage of overlap for each of the 49 measures is listed in column 7 of Tables 2 and 3. Clearly, using this method of contrast, membership in two supposedly discrete groups could not be differentiated.

A third comparison was achieved by tallying the number of students in the two groups who earned identical scores. Number of pairs of identical scores is reported in column 6 of Tables 2 and 3. The number

of possible pairs was 49 except for the Behavior Problem Checklist, where the number of possible pairs was 33. Excluding this device from the analysis, the number of pairs ("twins") ranged from 19 to 44. In all but two cases, the number of pairs was greater than 25, indicating essentially that more than half of the scores in the two groups were identical.

Two follow-up analyses were used in an effort to ascertain the extent to which students were misclassified when eligibility on the basis of applying the Federal definition of learning disabilities was contrasted with actual school placement. We first operationalized the Federal definition by computing students' scores in five of the seven areas represented by the definition. We then used three different indices of severity in calculating deficits, employing a 1 standard deviation, 1.5 standard deviation, and 2 standard deviation cutoff in classifying all 99 students as either LD or Non-LD. When a two standard deviation cutoff was used, only three of the 99 students were classified as LD; these data are not reported. Numbers of students classified as LD using a one standard deviation deficit and a 1.5 standard deviation deficit are reported in Table 4. Numbers classified are reported for each device and for a composite. The composite was derived by strict adherence to the criterion of an observed deficit in <u>one or more</u> of the seven areas. The composite is of most use for purposes of understanding the number of students misclassified. When a 1.5 standard deviation criterion was applied, 40 of the 99 students were misclassified (seven students who were classified by means of the Federal definition as LD, were classified by the school as Non-LD; 33 students

who did not meet the Federal criteria were identified by the school as LD).

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Insert Table 4 about here

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When a criterion of one standard deviation deficit was applied, again 40 of the 99 students were misclassified, but a different 40 (30 students who met the Federal definition of LD were classified as Non-LD by the schools; 10 students who did not meet the Federal criteria were classified as LD by the schools).

Given the large number of misclassified students, t tests were used to ascertain variables that differentiated the groups. Differences between students misclassified as LD and those misclassified as Non-LD were observed on two measures. Students who according to Federal definition were not LD but whom the school had classified as LD (the false positives) demonstrated significantly more behavior problems than students who were misclassified as Non-LD (the false negatives). Yet, students who met Federal criteria for LD, but whom the school had classified as Non-LD (the false negatives) earned significantly lower scores in mathematics computation than did students who were misclassified as LD.

Discussion

The results obtained in this investigation raise very serious concerns regarding the differential classification of poorly achieving students as either learning disabled or non-learning disabled. While Cromwell, Blashfield, and Strauss (1975) argue that "Diagnostic systems should have clear definitions and a coherent logical structure,"

the evidence obtained in this investigation indicates either serious confusion regarding definition or a failure on the part of decision makers to adhere to and decide in accord with an accepted definition.

It is clear that educators must continue to classify students to ascertain their eligibility for special education services. That is precisely the purpose classification serves, as observed so well by Kramer (1975):

> Classification of persons is the essential process in determining their eligibility for various health and social benefits and services to which they may be entitled and in evaluating their claims for such benefits. Governmental agencies must classify applicants to ascertain their eligibility for benefits provided by federal, state, and local laws, and their claims for such benefits. (p. 57)

Hobbs (1975) notes that:

> Diagnostic categories provide a rationale for ordering knowledge, making decisions about individual children, organizing school systems and governmental bureaus, planning budgets, and assessing the outcomes of educational and treatment programs. The adequacy of diagnostic classifications is therefore an issue of great importance. (p. 42)

The current investigation examined the difference between students classified by the schools they attend as learning disabled, and those who are performing poorly in school. No psychometric differences of practical utility between the groups were observed; from 82 to 100 percent of the students in the two groups earned scores within a common range on 49 different psychometric measures. A comparison of the schools'

classifications of students with a hypothetical classification achieved by strict application of the Federal definition of learning disabilities indicated that 40 of the 99 students were "misclassified."

Several competing conclusions could be reached regarding the obtained findings. Many professionals in the field of learning disabilities believe that current identification efforts miss many low-achieving students who are, in fact, learning disabled, thereby resulting in denial of services to these students. The argument <u>can</u> be supported using the obtained data. One could very well argue that the students who were achieving poorly were, in fact, learning disabled. No difference was observed in the performance of the two groups on psychometric measures. Using a one standard deviation definitional criterion, 30 students who by Federal definition were LD, were classified by the schools as Non-LD, while only 10 were misclassified as LD.

Many other professionals in the field of learning disabilities argue that too many students who are simply underachievers are identified by schools as learning disabled and that such identification results in both stigma and limitation of students' life opportunities. This argument, too, <u>can</u> be supported by the obtained data. There were no psychometric differences in the performances of the two groups of students. Using a 1.5 standard deviation deficit, 33 students were misclassified as LD, while only seven students were misclassified as Non-LD. It is little wonder that considerable confusion exists regarding identification of learning disabled students. One need only to pick his/her argument, and then use a cutoff score that will produce

data to support it. The one conclusion that is appropriate, is that there is considerable misclassification in identification of learning disabled students. In this investigation we were unable to identify psychometric measures that would differentiate the groups. Approximately 40% of the students were misclassified. The extent to which misclassification results in negative consequences for the students is an open question. As Cromwell, Blashfield, and Strauss (1975) observe

> While formal classification and terminology are developed by scientists and practitioners to meet their particular purposes for understanding and intervention, they become a part of broader public usage. Sometimes this broader usage is beneficial (favorable political, social, or economic decisions are made). Sometimes the broader usage is not beneficial (discrimination or loss of freedom occurs). (p. 14)

We do not yet have good enough data regarding the extent to which identification as learning disabled and consequent intervention are beneficial. The reported investigation could not, and was not designed to, yield an understanding of the condition of learning disabilities or examine the benefits derived from labeling and treatment. As Rains, Kitsuse, Duster, and Friedson (1975) observe:

> A study of individuals who are classified, categorized, and differentiated in a common population is not likely by itself to yield an understanding of "the problem" or a basis for assessing the relative value of programs of remediation or treatment. Quite literally, it is the

process of differentiation that has created and defined "the problem" and assigned it to those identified as "having it." (p. 91)

In the present investigation we could not identify precisely the basis for differentiation in labeling students learning disabled. Rains et al. (1975) state that "Whatever their sources (psychiatric, medical, educational, legal), classification systems are in fact used to fit the purposes and needs of those who employ them organizationally" (p. 92). We must begin to evaluate very carefully the purposes and needs being served by identifying certain students as LD while not identifying others (who are very much their twins) as LD.

References

Abroms, K. I., & Kodera, T. L. Acceptance hierarchy of handicaps: Validation of Kirk's statement, "Special education often begins where medicine stops." Journal of Learning Disabilities, 1979, 12, 15-20.

Algozzine, B., Forgnone, C., Mercer, C. D., & Trifiletti, J. J. Toward defining discrepancies for specific learning disabilities: An analysis and alternatives (Research Report No. 7). Minneapolis: University of Minnesota, Institute for Research on Learning Disabilities, 1979.

Algozzine, B., & Sutherland, J. Non-psychoeducational foundations of learning disabilities. The Journal of Special Education, 1977, 11, 91-98.

Bryan, T., & Wheeler, R. Perception of learning disabled children: The eye of the observer. Journal of Learning Disabilities, 1972, 5, 484-488.

Cromwell, R. L., Blashfield, R. K., & Strauss, J. S. Criteria for classification systems. In N. Hobbs (Ed.), Issues in the classification of children (Vol. 1). San Francisco: Jossey-Bass, 1975.

Federal Register. Procedures for evaluating specific learning disabilities, Vol. 42 (250), Dec. 29, 1977.

Forness, S. R., & Esveldt, K. C. Classroom observation of children with learning and behavior problems. Journal of Learning Disabilities, 1975, 8, 382-385.

Hallahan, D. P., & Kauffman, J. M. Categories, labels, behavioral characteristics: ED, LD, and EMR reconsidered. Journal of Special Education, 1978, 11, 139-147.

Hobbs, N. (Ed.). Issues in the classification of children (Vol. 1). San Francisco: Jossey-Bass, 1975.

Kramer, M. Diagnosis and classification in epidemiological and health-services research. In N. Hobbs (Ed.), Issues in the classification of children (Vol. 1). San Francisco: Jossey-Bass, 1975.

McGue, M., Shinn, M. R., & Ysseldyke, J. E. The validity of the Woodcock-Johnson Psychoeducational Battery for the assessment of learning disabled children (Research Report). Minneapolis: University of Minnesota, Institute for Research on Learning Disabilities, 1979.

Mercer, C. D. Children and adolescents with learning disabilities. Columbus, Ohio: Charles E. Merrill, 1979.

Neisworth, J. T., & Greer, J. G. Functional similarities of learning disability and mild retardation. Exceptional Children, 1975, 42(2) 17-25.

Rains, P. M., Kitsuse, J. J., Duster, T., & Friedson, E. The labeling approach to deviance. In N. Hobbs (Ed.), Issues in the classification of children (Vol. 1). San Francisco: Jossey-Bass, 1975.

Rickey, D. D., & McKinney, H. D. Classroom behavioral styles of learning disabled boys. Journal of Learning Disabilities, 1978, 11, 38-43.

Salvia, J., & Ysseldyke, J. Assessment in special and remedial education. Boston: Houghton-Mifflin, 1978.

Wepman, J. M., Cruickshank, W. M., Deutsch, C. P., Morency, A., & Strothers, C. R. Learning disabilities. In N. Hobbs (Ed.), Issues in the classification of children (Vol. 1). San Francisco: Jossey-Bass, 1975.

Woodcock, R. W., & Johnson, M. B. Woodcock-Johnson psycho-educational battery. Boston: Teaching Resources, 1977.

Ysseldyke, J. E., & Algozzine B. Perspectives on assessment of learning disabled students. Learning Disabilities Quarterly, in press.

Footnote

Bob Algozzine, consultant to Minnesota's Institute, is Assistant Professor at the University of Florida, Gainesville.

Table 1

Description of Subjects on Selected Demographic Variables

	Sex of Child		Parental Marital Status		Age of Child (in months)		Father's SES		Mother's SES		Family Income	
	Male	Female	Married	Unmarried	$\bar{X}$	S.D.	$\bar{X}$	S.D.	$\bar{X}$	S.D.	$\bar{X}$	S.D.
LD	40	10	26	9	121.04	5.04	58.32	25.84	47.56	24.16	$21423	10477
Non-LD	35	14	28	8	121.06	4.04	51.44	27.57	46.35	18.07	$22852	11027

Table 2

Means, Standard Deviations, Mean Differences, Number of Identical Scores, and Percentage of Overlap for LD and Non-LD Children on the Woodcock-Johnson Subtests

Subtest	Non-LD		LD		Mean Differences	Identical Scores[a]	Percentage of Overlap
	Mean	SD	Mean	SD			
Analogies	15.29	3.64	15.48	3.42	-.19	36	97
Numbers Reversed	7.02	2.31	6.24	1.95	.78	40	94
Spatial Relations	39.49	4.73	38.48	5.63	1.01	37	97
Visual Matching	16.76	1.79	16.00	2.34	.76	38	97
Proofing*	8.14	2.46	7.04	2.85	1.1	38	97
Calculation	15.00	2.81	13.92	2.94	1.08	37	99
Concept Formation	16.22	3.97	16.12	6.53	.10	35	94
Picture Vocabulary*	18.33	1.99	17.22	2.73	1.11	36	96
Quantitative Concepts*	21.98	2.56	20.72	2.99	1.26	36	96
Blending	16.78	2.90	15.66	2.82	1.12	35	97
Visual Auditory	114.88	7.96	114.50	8.24	.38	27	97
Analysis/Synthesis	17.39	3.52	18.02	3.74	-.63	33	97
Applied Problem*	28.10	3.00	26.71	3.01	1.39	35	93
Memory for Sentences*	13.29	1.99	11.62	2.69	1.67	31	95
Passage Comprehension*	15.02	2.24	12.51	2.80	2.51	28	93
Word Attack*	12.94	5.32	9.39	4.54	3.55	26	96
Antonyms/Snyonyms*	20.57	2.72	17.46	4.53	3.11	29	97
Dictation*	18.16	2.49	14.96	2.78	3.20	26	91
Letter Word Identification*	33.35	2.98	29.39	3.82	3.96	23	82

* Difference between means significant ($p < .05$).

[a] Number of identical scores possible was 49

Table 3

Means, Standard Deviations, Mean Differences, Number of Identical Scores and Percentage of Overlap for Non-LD and LD on Selected Psychoeducational Devices

Domain	Test/subtest	Non-LD Mean	Non-LD S.D.	LD Mean	LD S.D.	Mean Difference	Number of Identical Scores	Percentage of Overlap
Cognitive								
	WISC-R Full Scale	102.88	9.72	99.92	12.66	2.96	27	99
	WISC-R Verbal	100.47	11.75	96.98	12.46	3.48	27	97
	WISC-R Performance	102.90	13.47	103.92	14.09	-1.02	22	98
	WISC-R Information*	101.94	11.63	96.30	11.42	5.64	39	99
	WISC-R Similarities	101.33	13.91	98.10	16.65	3.23	35	96
	WISC-R Arithmetic	95.10	10.97	93.10	10.44	2	42	100
	WISC-R Vocabulary*	102.55	11.14	97.20	10.40	5.35	33	93
	WISC-R Comprehension	106.22	12.35	102.86	15.24	3.36	35	98
	WISC-R Picture Completion	104.29	13.46	102.80	13.06	1.49	38	99
	WISC-R Picture Arrangement	106.63	12.72	106.90	16.34	- .27	38	96
	WISC-R Block Design	98.78	17.57	102.50	13.33	-3.72	38	95
	WISC-R Object Assembly	105.51	14.62	107.55	17.65	-2.04	38	98
	WISC-R Coding	100.00	12.99	100.10	17.30	- .10	37	98
Achievement								
	PIAT Math*	101.02	11.14	96.08	10.47	4.94	26	97
	PIAT Reading Comprehension*	100.51	7.34	93.04	11.01	7.47	31	92
	PIAT Reading Recognition*	100.69	8.42	91.80	8.98	8.89	19	90
	PIAT Spelling	95.84	8.17	88.48	10.33	7.36	25	92
	PIAT General Information*	104.31	9.10	96.56	10.38	7.75	24	90
	PIAT Total Test*	100.61	6.49	91.90	8.78	8.71	24	88
	Stanford Math Calculation	90.27	9.03	88.82	9.78	1.45	30	99
	Stanford Math Concepts	89.33	10.60	88.70	13.13	.63	31	99
Perceptual Motor								
	Bender	2.27	1.71	2.52	2.08	- .44	44	99
	Beery	14.90	2.16	15.46	2.61	- .56	39	99
Self-Concept								
	Piers-Harris	51.94	11.70	52.34	16.80	- .4	21	97
Behavior Ratings								
	Behavior Problem Checklist*	10.21	10.40	19.29	15.22	-9.08	16	97

* Difference between means significant ($p < .05$).

[a] Number of identical scores possible was 49 except for BPC in which it was 33.

Table 4

Numbers of Students Classified as LD and Non-LD by Schools in Contrast to Classification Using the Federal Definition and a Criterion of 1 of 1.5 Standard Deviation Deficit

	W-J Reading				W-J Written Language				Stanford Math Concepts			
	1.0 SD		1.5 SD		1.0 SD		1.5 SD		1.0 SD		1.5 SD	
	LD	Non-LD	LD	Non-LD	LD	Non-LD	LD	Non-LD	LD	Non-LD	LD	Non-LD
LD	27	23	8	42	25	25	6	44	21	29	6	44
Non-LD	8	41	0	49	7	42	0	49	22	27	6	43

	Stanford Math Computation				Piat Reading Comprehension				Composite			
	1.0 SD		1.5 SD		1.0 SD		1.5 SD		1.0 SD		1.5 SD	
	LD	Non-LD	LD	Non-LD	LD	Non-LD	LD	Non-LD	LD	Non-LD	LD	Non-LD
LD	21	29	6	44	10	40	6	44	40	10	17	33
Non-LD	22	27	6	43	0	49	0	49	30	19	7	42

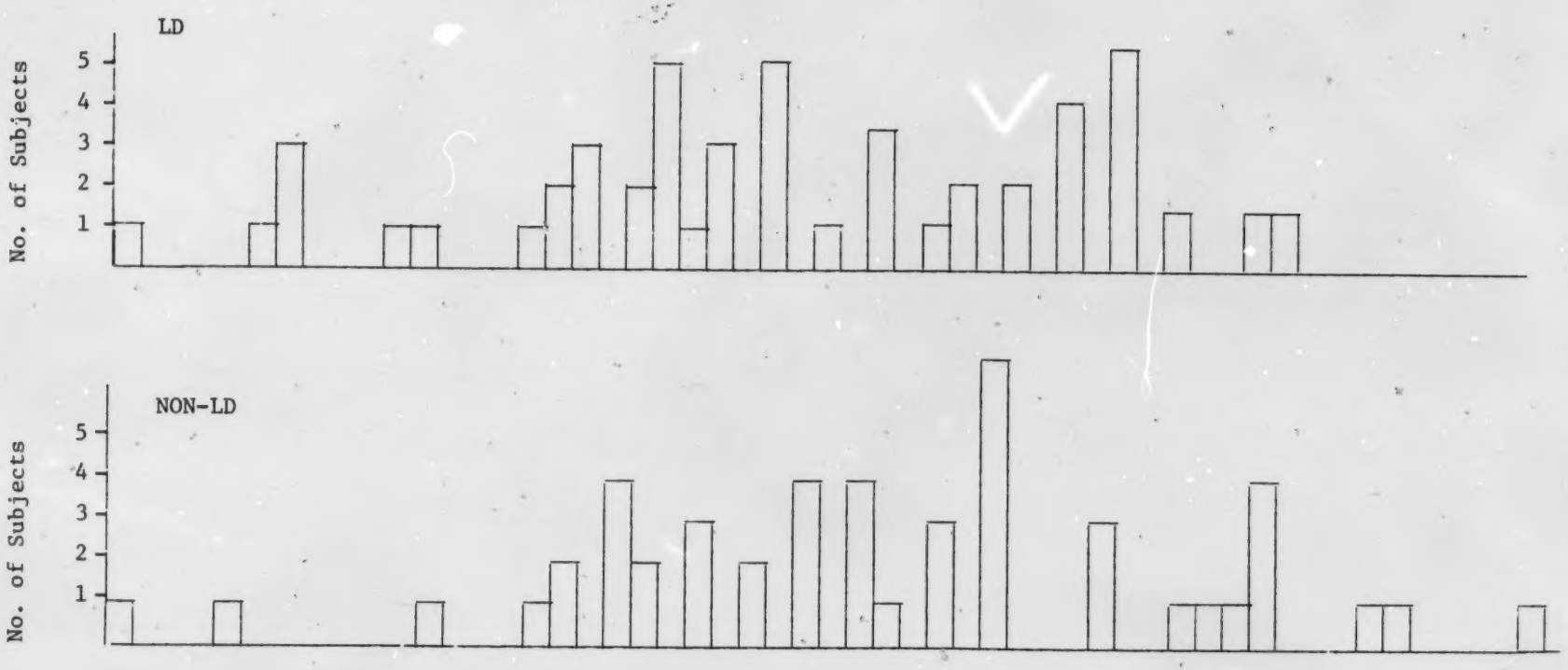

Figure 1. Distribution of Standard Scores on PIAT Math for LD and Non-LD Subjects

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Ysseldyke, J. E. Assessing the learning disabled youngster: The state of the art (Research Report No. 1). November, 1977.

*Ysseldyke, J. E. Research and development plan: University of Minnesota Institute for Research on Learning Disabilities (Monograph No. 1). June, 1978.

*Ysseldyke, J. E., & Thurlow, M. L. (Eds.). Synthesis of the knowledge base: Identification and assessment of learning disabled children (Monograph No. 2). June, 1978.

*Ysseldyke, J. E. Organizational plan for Minnesota's Institute for Research on Learning Disabilities (Monograph No. 3). June, 1978.

*Ysseldyke, J. E., & Thurlow, M. L. Specific investigations to be completed during years two and three (Monograph No. 4). June, 1978.

*Ysseldyke, J. E., & Thurlow, M. L. Training opportunities at Minnesota's Institute for Research on Learning Disabilities (Monograph No. 5). June, 1978.

*Ysseldyke, J. E. Client base (Monograph No. 6). June, 1978.

Ysseldyke, J. E., & Regan, R. R. Nondiscriminatory assessment and decision making (Monograph No. 7). February, 1979.

**Thurlow, M., & Ysseldyke, J. Assessment in the child service demonstration centers for learning disabled children (Research Report No. 2). March, 1979.

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*As part of its continuation proposal, the Institute was required to prepare these monographs. Because they are part of the proposal, they are not available for general distribution.

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Foster, G., Algozzine, B., & Ysseldyke, J. Susceptibility to stereotypic bias (Research Report No. 3). March, 1979.

Algozzine, B. An analysis of the disturbingness and acceptability of behaviors as a function of diagnostic label (Research Report No. 4). March, 1979.

Algozzine, B., & McGraw, K. Diagnostic testing in mathematics: An extension of the PIAT? (Research Report No. 5). March, 1979.

Deno, S. L. A direct observation approach to measuring classroom behavior: Procedures and application (Research Report No. 6). April, 1979.

Ysseldyke, J. E., & Mirkin, P. K. Proceedings of the Minnesota round-table conference on assessment of learning disabled children (Monograph No. 8). April, 1979.

Somwaru, J. P. A new approach to the assessment of learning disabilities (Monograph No. 9). April, 1979.

Algozzine, B., Forgnone, C., Mercer, C. D., & Trifiletti, J. J. Toward defining discrepancies for specific learning disabilities: An analysis and alternatives (Research Report No. 7). June, 1979.

Algozzine, B. The disturbing child: A validation report (Research Report No. 8). June, 1979.

Ysseldyke, J. E., Algozzine, B., Regan, R., & Potter, M. Technical adequacy of tests used by professionals in simulated decision making (Research Report No. 9). July, 1979.

Jenkins, J. R., Deno, S. L., & Mirkin, P. K. Measuring pupil progress toward the least restrictive environment (Monograph No. 10). August, 1979.

Mirkin, P. K., & Deno, S. L. Formative evaluation in the classroom: An approach to improving instruction (Research Report No. 10). August, 1979.

Thurlow, M. L., & Ysseldyke, J. E. Current assessment and decision-making practices in model programs for the learning disabled (Research Report No. 11). August, 1979.

Deno, S. L., Chiang, B., Tindal, G., & Blackburn, M. Experimental analysis of program components: An approach to research in CSDC's (Research Report No. 12). August, 1979.

Ysseldyke, J. E., Algozzine, B., Shinn, M., & McGue, M. Similarities and differences between underachievers and students labeled learning disabled: Identical twins with different mothers (Research Report No. 13). September, 1979.